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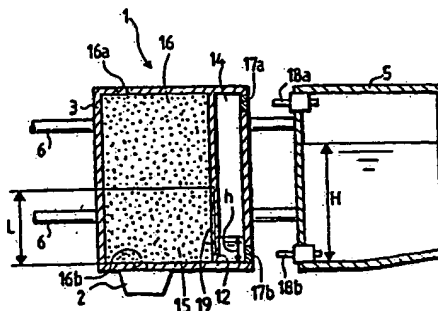
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(54) Ink refilling method for ink jet cartridge, recording apparatus using the method and ink container

(57) A method for refilling liquid using a refilling container (5) is to refill liquid to a liquid reserving container (3), which is provided with a first chamber (16) that houses a negative pressure generating member, at the same time, having an aperture conductively connected to the outside, and with a second chamber (14) conductively connected with the first chamber through a communicating unit for forming essentially a closed space with the exception of the communicating unit. This method comprises the step of forming an essentially closed space from the atmospheric air by means of the second chamber and the refilling container with the exception of the communicating unit in a state where the liquid surface of the refilling container (5) is positioned higher than the liquid surface of the second chamber, and the step of arranging the second chamber to be conductively connected with the refilling container by use of a first path that enables gas in the second chamber to communicate with gas in the refilling container, and a second path, which is different from the first path, arranged for shifting liquid in the refilling container into the second chamber. With the method thus arranged, liquid in the liquid refilling container is refilled into the liquid reserving chamber quickly and stably without leakage from the aperture arranged for the first chamber.

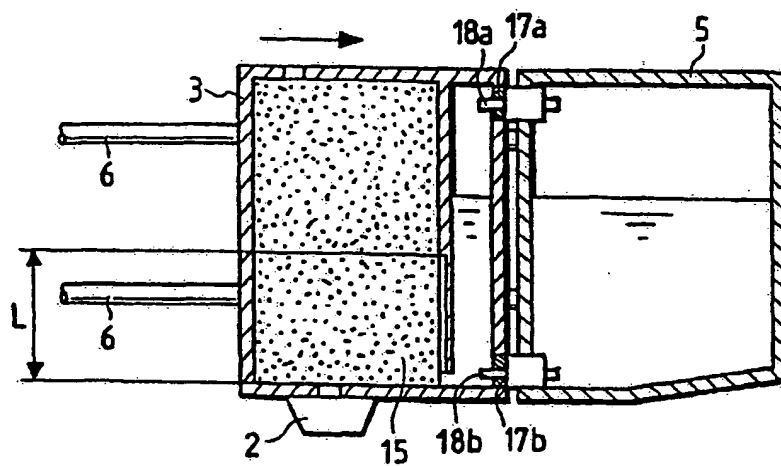
FIG. 2A



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FIG. 2B





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# EUROPEAN SEARCH REPORT

Application Number  
EP 97 30 2817 -

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cls)
A	US 5 488 480 A (CRYSTAL RICHARD G ET AL) * column 4, line 45 - column 6, line 34; figures 3A-4D *	1-4,11, 14-18,20	B41J2/175
A	KELCHAK: "Fluid-level controlling device" IBM TECHNICAL DISCLOSURE BULLETIN, vol. 24, no. 5, October 1981, pages 2264-2265, XP002053056	1-7,11, 14-18,20	
A	PATENT ABSTRACTS OF JAPAN vol. 095, no. 004, 31 May 1995 & JP 07 025025 A (CANON INC), 27 January 1995, * abstract *	1,2,4, 10-12, 14-18,20	
A	EP 0 640 484 A (CANON KK) * page 8, line 38 - page 10, line 33; figures 7-17 * * page 13, line 8 - page 14, line 7; figures 30A-34B *	1,4,11, 14-18,20	TECHNICAL FIELDS SEARCHED (Int.Cls)
A	GB 2 268 911 A (CANON KK) * page 15, line 24 - page 16, line 16; figure 1 * * page 22, line 16 - page 27, line 27; figures 10,11 *	1,2,4, 10-12, 14-18	B41J
A	EP 0 685 339 A (CANON KK) * column 6, line 37 - column 9, line 14; figures 3,4 *	1,2,4,6, 7,11, 14-18,20	
-/--			
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 8 April 1998	Examiner Adam, E
CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document		T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons &: member of the same patent family, corresponding document	

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**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

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(In case of Lack of Unity)

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



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# EUROPEAN SEARCH REPORT

Application Number  
EP 97 30 2817-

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cls)
A	EP 0 674 998 A (HEWLETT PACKARD CO)  * column 6, line 7 - column 7, line 15; figure 6 *	1,2,4-7, 10-12, 14,15, 18,20	
A	--- PATENT ABSTRACTS OF JAPAN vol. 008, no. 224 (M-331), 13 October 1984 & JP 59 104945 A (EPUSON KK), 18 June 1984, * abstract *	1-4,11, 12, 14-18,20	
P,A	--- US 5 515 663 A (ALLGEIER SR CHRISTOPHER L ET AL)		
X	--- US 4 967 207 A (RUDER JAMES L) * column 4, line 47 - column 5, line 13 * * column 8, line 3 - column 9, line 46; figures 6A-6C,7 *	19	
A	--- US 4 609 924 A (DE YOUNG THOMAS W) * column 2, line 54 - column 4, line 61; figures 1-4 *	19	
A	--- US 4 968 998 A (ALLEN ROSS R) -----		
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>8 April 1998</b>	Examiner <b>Adam, E</b>
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document</p> <p>T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons &amp;: member of the same patent family, corresponding document</p>			

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**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions, or groups of inventions, namely:

1. claims 1-18, 20:     Apparatus and method for refilling liquid using a reserving container having two chambers. A first chamber houses a negative pressure. A second chamber communicates with the first chamber and with a refilling container. Two paths between the second chamber and the refilling container allow gas communication and ink supply.
2. claim 19:             Method of operating an ink jet recording apparatus comprising the step of moving a recording head having a container to a replenishment station when it is detected that the container needs replenishment.

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